PB88-145099

Superfund Record of Decision (EPA Region 2)
Chemical Control Corporation
Elizabeth, New Jersey (First Remedial Action)
September 1987

(U.S.) Environmental Protection Agency
Washington, DC

23 Sep 87

U.S. Department of Commerce
National Technical Information Service
NTIS

PB88-145099

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Office of
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EPA/ROD/R02-87/041
September 1987

EPA

Superfund Record of Decision:

Chemical Control, NJ

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15. SUPPLEMENTARY NOTES

16. ABSTRACT

The Chemical Control Corporation (CCC) site, consisting of 2.2 acres and a portion of the Elizabeth River, is located in Union County, New Jersey. The site area, formerly a marsh, is flat and barely above sea level. The surrounding area is mostly industrial. However, one residence is within 200 feet of the site. Densely populated neighborhoods are located across the Elizabeth River. From 1970 to 1978, CCC operated as a hazardous waste storage, treatment and disposal facility accepting various types of chemicals including: acids, arsenic, bases, cyanides, flammable solvents, PCBs, compressed bases, biological agents and pesticides. Throughout its operations, CCC was cited for discharge and waste storage violations. In March 1979, the State of New Jersey initiated a site cleanup of bulk solids and liquids, drums at and below the surface, gas cylinders, infectious wastes, radioactive wastes, highly explosive liquids, debris, tanks and three feet of soil. Excavated soil areas were replaced with a three foot gravel cover.

An April 1980 explosion and fire interrupted the site cleanup and created additional cleanup needs by destroying the site and reportedly launching drums of burning waste into the air. From November 1980 until July 1981, the State operated a ground water recovery and treatment system. Initial Remedial Measures conducted at the site have mitigated the immediate hazards. The site closure RI, completed in July 1986,
(See Attached Sheet)

17. KEY WORDS AND DOCUMENT ANALYSIS

a. DESCRIPTORS	b. IDENTIFIERS/OPEN ENDED TERMS	c. COSATI Field/Group
Record of Decision Chemical Control, NJ First Remedial Action Contaminated Media: soil, sediments, river Key contaminants: organics, VOCs, pesticides, metals		

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16. ABSTRACT (continued)

determined that soils beneath those previously removed are highly contaminated with a variety of organic compounds and to a lesser degree with metals. These contaminants are strongly absorbed into the soil. Sediments along the Elizabeth River are also contaminated. However, the greatest potential risk from this site is associated with the possible exposure of the contaminated soil. The primary contaminants of concern effecting the soil include: organics, VOCs, pesticides, acid and base-neutral extractables and metals.

The selected remedial action includes: treatment of approximately 18,000 cubic yards of contaminated soils using in-situ fixation (solidification); removal of debris including drill cuttings, monitoring well development water, items recovered from the river under the IRM, used disposable equipment and the decontamination pad; sealing of the sanitary sewer line under the site; and repair of the site/river berm. The estimated capital cost for this remedial action is $7,208,000 with annual O&M of $57,400 for years 1-5 and $22,400 for years 6-30.

DECLARATION STATEMENT

RECORD OF DECISION

Chemical Control Corporation

SITE NAME AND LOCATION

Chemical Control Corporation, Elizabeth, Union County, New Jersey

STATEMENT OF PURPOSE

This decision document presents the selected remedial action for the Chemical Control Corporation site, developed in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended by the Superfund Amendments and Reauthorization Act of 1986, and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, November 20, 1985.

STATEMENT OF BASIS

I am basing my decision primarily on the following documents, which are contained in the administrative record and characterize the area and evaluate the relative merits of remedial alternatives for the Chemical Control site:

- Draft Remedial Investigation Report, Chemical Control Corporation, prepared by NUS Corporation, July 1986
- Draft Feasibility Study Report, Chemical Control Corporation, prepared by Ebasco Services Inc., June 1987
- Proposed Remedial Action Plan, Chemical Control Corporation, July 1987
- The attached Decision Summary for the Chemical Control site
- The attached Responsiveness Summary for the site, which incorporates public comments received
- Staff summaries and recommendations

DESCRIPTION OF THE SELECTED REMEDY

The remedial alternative presented in this document is a permanent solution for closure of the Chemical Control site. It addresses the contaminated soil remaining at the site. Contained wastes, contaminated buildings and some contaminated soil were addressed in previous response actions.

This action consists of the following components:

- Treatment of the contaminated soil at the site using in-situ fixation

- Removal of debris remaining from earlier response actions, including drill cuttings, monitoring well development water, items recovered from the Elizabeth River under the initial remedial measure, used disposable equipment, and the decontamination pad

- Sealing of the sanitary sewer line under the site where it connects to the South Front Street storm sewer

- Repair of the berm that separates the site from the Elizabeth River

- Collection and analysis of environmental samples, as required, to ensure the effectiveness of the remedy, including an evaluation after five years to assess its protectiveness to public health and the environment.

DECLARATIONS

Consistent with the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, and the National Oil and Hazardous Substances Pollution Contingency Plan, 40 CFR Part 300, I have determined that the selected remedy is protective of human health and the environment, attains federal and state requirements that are applicable or relevant and appropriate for this action, and is cost-effective. Furthermore, this remedy satisfies the preference for treatment that reduces toxicity, mobility, or volume as a principal element. Finally, I have determined that this remedy utilizes permanent solutions and alternate treatment technologies to the maximum extent practicable.

The State of New Jersey has been consulted and agrees with the selected remedy, as is documented in the attached letter of concurrence.

I have also determined that the actions being taken at the Chemical Control site are appropriate when balanced against the availability of Superfund monies for use at other sites.

September 23, 1987
Date

Christopher J. Daggett
Regional Administrator

ATTENTION

AS NOTED IN THE NTIS ANNOUNCEMENT, PORTIONS OF THIS REPORT ARE NOT LEGIBLE. HOWEVER, IT IS THE BEST REPRODUCTION AVAILABLE FROM THE COPY SENT TO NTIS.

STATE OF NEW JERSEY
DEPARTMENT OF ENVIRONMENTAL PROTECTION
RICHARD T. DEWLING, Ph.D., P.E., COMMISSIONER
CN 402
TRENTON, N.J. 08625
609 - 292 - 2885

18 SEP 1987

Mr. Christopher J. Daggett
Regional Administrator
USEPA - Region II
26 Federal Plaza
New York, NY 10278

Dear Regional Administrator Daggett:

This is to formally notify you that the New Jersey Department of Environmental Protection has reviewed the draft Record of Decision for the Chemical Control Corporation Site and concurs with the recommended remedy. This remedy will consist of the following:

- Treat the contaminated soil at the site using in-situ fixation.
- Remove debris remaining from earlier response actions, including drill cuttings, monitoring well development water, items recovered from the Elizabeth River under the Initial Remedial Measure, used disposable equipment, and the decontamination pad.
- Seal the sanitary sewer line under the site where it connects to the South Front Street storm sewer.
- Repair the berm that separates the site from the Elizabeth River.
- Collect and analyze environmental samples, as required, to ensure the effectiveness of the remedy.

New Jersey fully appreciates the importance of the Record of Decision in the cleanup process and will continue to take all reasonable steps to ensure that the State's commitments in this area are met.

Sincerely,

Michael A Catania for

Richard T. Dewling

100% Recycled

Decision Summary

Chemical Control Corporation

SITE LOCATION AND DESCRIPTION

The Chemical Control Corporation property is located at 23 South Front Street in Elizabeth, Union County, New Jersey. The site consists of this 2.2-acre property and the portion of the Elizabeth River adjacent to the property. It is part of a narrow peninsula formed by the Elizabeth River and the Arthur Kill (Figure 1). This peninsula was a marsh until it was filled to prepare it for industrial development. The Elizabeth River, the Arthur Kill, and the water table aquifer at the site are all saline and tidally influenced. The site is flat and barely above sea level.

Although the surrounding area is mostly industrial, there is a residence 200 feet northeast of the site. Densely populated neighborhoods are located across the Elizabeth River, and the total population of the City of Elizabeth exceeds 100,000. The site itself is currently fenced and covered with coarse gravel. The buildings and storage tanks that were used by Chemical Control during its operations were removed under earlier response actions. Commercial ship traffic is heavy in the Arthur Kill, and both the Arthur Kill and the Elizabeth River are used for recreational boating. Although shellfishing in the Arthur Kill has been restricted by the State of New Jersey since 1980, city officials report it is still actively pursued by recreational fisherman within three-quarters of a mile of the site.

SITE HISTORY

Origin of Problem

Chemical Control Corporation operated from 1970 until 1978 hauling, treating, and disposing of a wide variety of industrial wastes. Throughout its operations, it was cited for violations that included discharging liquids onto the ground adjacent to the Elizabeth River and accumulating thousands of drums of incompatible wastes. After failing to comply with an order from the State of New Jersey to clean up its operations, Chemical Control Corporation was placed into operational receivership by a judge of the Superior Court of New Jersey.

Initial Response Actions

The State began a clean-up of the site in March 1979 that by April 1980, when the site was destroyed by fire, had removed 55,400 pounds of bulk solids, 1800 gallons of bulk liquids, nearly 10,000 drums of waste, 83 gas cylinders, 10 pounds of infectious wastes, 7 pounds of radioactive wastes, and 24 gallons of highly explosive liquids. On April 21, 1980, an explosion and fire occurred at the site that was not brought under

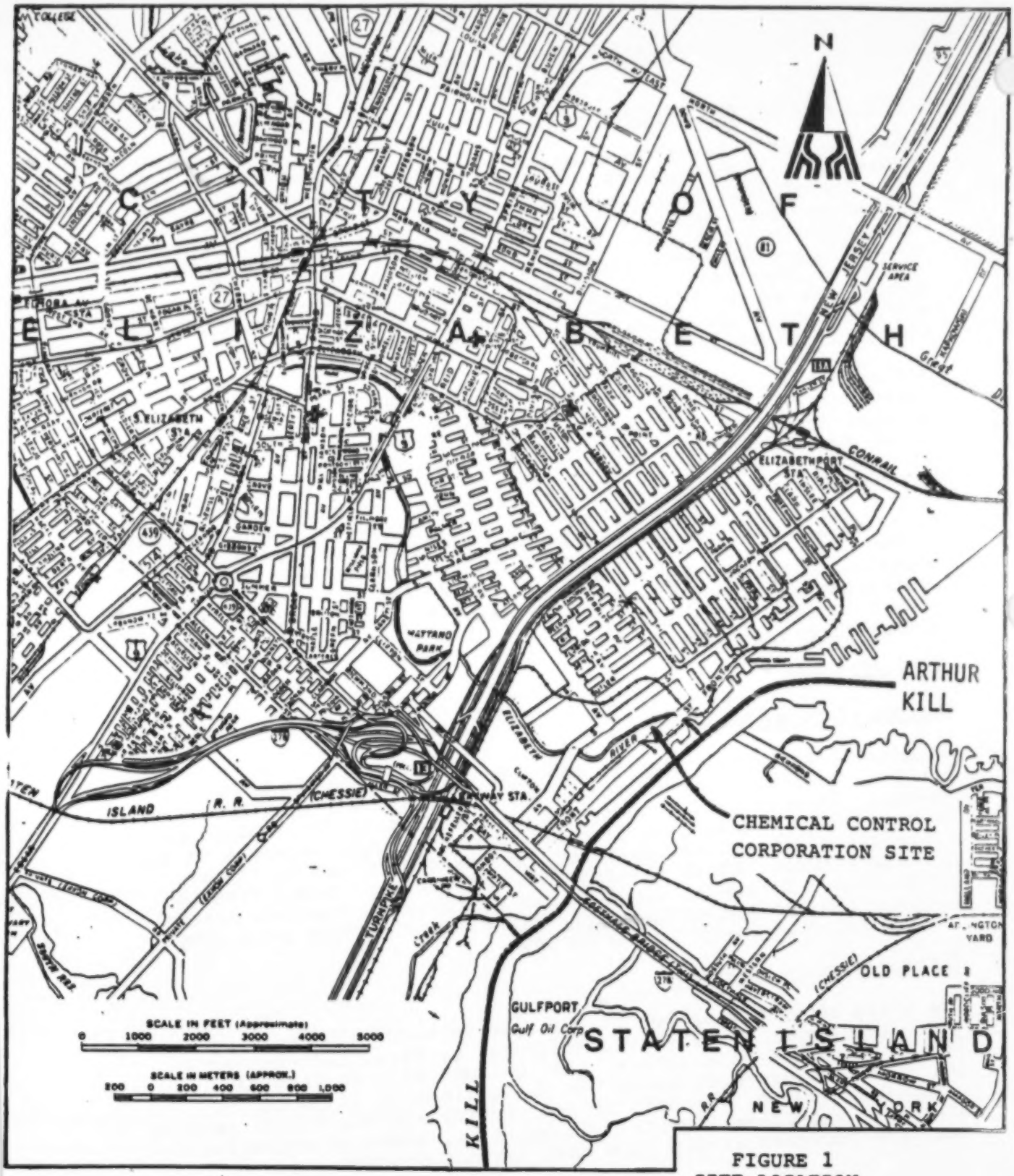


FIGURE 1
SITE LOCATION

control for over ten hours. The explosion and fire destroyed buildings at the site and reportedly launched drums of burning waste into the air.

New Jersey continued its (pre-Superfund) clean-up operation after the fire and removed all building debris, drums (found on and below the surface), and tanks from the site. Three feet of surface soil was also removed from the site and from a property across the street that had been used as a staging area during the clean-up. This soil was replaced with three feet of gravel. Gas cylinders, which were discovered during this operation, were stored at the site. The State also operated a groundwater recovery and treatment system from November 1980 until July 1981.

Remedial Actions taken by EPA

Initial Remedial Measures

In 1981, the site was ranked for inclusion on the Superfund Interim Priorities List. A State Superfund Contract was signed by the Environmental Protection Agency (EPA) and the New Jersey Department of Environmental Protection (NJDEP) in September 1983. The Scope of Work (SOW) for the contract identified remedial actions that remained to be completed at the site. These actions are described below. The SOW also called for a feasibility study (FS) to determine the appropriate remedial action for closing the site. This Record of Decision selects a remedial action based on the findings of the remedial investigation (RI) and the FS and public comments as summarized in the Responsiveness Summary, which is attached.

At the end of New Jersey's response action, eleven box trailers and one vacuum truck, which were used during the response, were left at the site. As part of an Initial Remedial Measure (IRM) undertaken by the EPA, the trailers and the vacuum truck were decontaminated at the site and removed for disposal. This IRM also involved repairing the storm sewer system at South Front Street adjacent to the site. The system had been damaged by heavy equipment used in the response action and had been plugged with sand during the fire to prevent contaminated water from discharging to the Arthur Kill. The storm sewer was cleared of any blockage and the manholes, catch basins, and curbs were repaired.

Based on reports that the Chemical Control Corporation may have dumped drums into the Elizabeth River and that drums might have entered the river during the fire, an IRM was conducted by the EPA to locate and identify metallic objects in the river and recover those objects that might contain hazardous waste. The first phase of this IRM determined that there were many fewer containers in the river than had been expected. Nevertheless, five drums, three cylinders, three pails, one can, two drum lids, and a piece of sheet metal were recovered. The one intact gas cylinder was placed in an overpack and is now awaiting disposal

as part of the gas cylinder project described below. The rest of the recovered items are being stored in drums and are awaiting disposal as part of the site closure action. This project is described in more detail in the Project Summary Report for the Chemical Control Corporation Elizabeth River Drum Removal submitted to the EPA by NUS Corporation in May 1986.

The purpose of the final IRM to be conducted at the site is to sample and remove 189 deteriorated gas cylinders. The original plan to dispose of the cylinders involved detonating them at a Department of Defense facility in New Jersey. However, subsequent discussions with Defense Department officials revealed they were not willing to allow the use of one of their facilities for this purpose. Further, the cylinders could not be manifested for removal from the site because the contents were unknown. The cylinders were overpacked in August 1984 to prevent further deterioration and to contain potential releases while a cylinder sampling device was being designed. Specifications for the sampling and disposal of the gas cylinders were completed in the summer of 1987. The contract for the IRM should be awarded in the fall of 1987.

The remedial measures that have been implemented at the site have mitigated the immediate hazards. The site is surrounded by a security fence, and a layer of gravel (ranging from one to three feet thick) covers the entire surface. The only contained wastes remaining at the site are the gas cylinders, which are being addressed under a separate action, and drums of waste from the RI and the Elizabeth River IRM. These drums contain drill cuttings from the soil borings, water from the development of the monitoring wells, used protective equipment, and objects recovered from the Elizabeth River. There is also some loose trash from the RI at the site, including used hoses and protective equipment. An earthen berm separates the site from the Elizabeth River. Before the storm sewer was repaired, this berm prevented storm water from running into the Elizabeth River. To alleviate flooding on South Front Street, two openings were cut in the berm. Now that the storm sewers are once again functional, the openings in the berm are unnecessary.

Remedial Investigation

The site closure RI, completed in July 1986, determined that soils beneath those removed by the NJDEP are highly contaminated with a variety of organic compounds and to a lesser degree with metals. It also found that these contaminants are strongly adsorbed to the soil and are present in the groundwater in relatively low concentrations. A similar partitioning of contaminants also exists in the Elizabeth River where sediments are contaminated. The contaminants found in the sediments, however, are not all attributed to the Chemical Control site. The FS which followed examined several potential remedial actions. The findings are summarized in the following sections.

Beneath the gravel at the site, there is a layer of silty marsh deposits mixed with fill material that was used to raise the ground surface above the water table. This stratum, which averages approximately ten feet thick, is highly contaminated with a wide range of organic chemicals and less severely with metals. A list of hazardous substances detected at the site is provided in Table 1. Beneath this contaminated stratum, there is a layer of relatively clean, impermeable clay. Chemical data for the subsurface samples are presented in Figure 2, and a cross-section of the site is illustrated in Figure 3.

Although the soil at the site is highly contaminated, the groundwater in contact with this soil is relatively clean. Three physical factors may be responsible for the strong adsorption of contaminants on the soil: the soil itself is composed of highly organic marsh deposits (which have a high affinity for organic contaminants), many of the contaminants present in the soil are nearly insoluble in water, and the high salinity of the groundwater tends to further reduce the solubility of these compounds. Although many of the contaminants are held tightly to the soil, some of the more mobile chemicals continue to leach into the groundwater. Chemical data for two rounds of groundwater samples are provided in Figure 4. The groundwater from the site discharges to the Elizabeth River through the river banks and from two leachate seeps, which have formed where the berm along the river has been damaged.

The human health risks associated with the contamination in the groundwater and the subsurface soil were evaluated in the RI. The greatest potential risk from this site is associated with the possible exposure of the contaminated soil. Significant health threats are posed by direct contact, fugitive dust emission, and volatilization. However, the contaminated soils are below the water table and a layer of gravel, and the site is fenced. These factors significantly reduce the risks posed by the exposure pathways identified. Contaminants are only leaving the site via the groundwater. Although the groundwater is saline and therefore not a source of drinking water, some contaminants leave the site and discharge to the Elizabeth River. The quality of the surface water is discussed below.

Extensive sampling of water and sediment in the Elizabeth River was performed during the RI. The results of the analysis of samples showed that sediments in the Elizabeth River were highly contaminated while only low concentrations of very few contaminants were detected in the river water. The Elizabeth River was sampled inland (upstream at low tide) to where Route 1&9 crosses it. At this point, the river becomes a concrete channel so sediment sampling farther upstream is not possible. Downstream, water and sediment samples were collected out to and in the Arthur Kill.

TABLE 1

RANGES OF CHEMICAL CONCENTRATIONS BY MEDIUM

Concentration ranges for organic contaminants in groundwater, surface water, subsurface soil, and river sediments are provided below. Ambient Water Quality Criteria (AWQC) for the protection of saltwater aquatic life are also included in this table. AWQC values are qualified with either:

C-chronic levels
A-acute levels

The AWQC are an Applicable or Relevant and Appropriate Requirement (ARAR) for concentrations in water only. There are no ARARs for concentrations in soil. Concentration ranges presented only represent the detected levels of the various chemicals. For each chemical, there was at least one sample that did not contain a detectable concentration. All water concentrations are in micrograms per liter (parts per billion-ppb); soil concentrations are in micrograms per kilogram (ppb).

CHEMICAL	GROUND WATER SAMPLES	SURFACE WATER SAMPLES	AWQC	
Volatiles				
acetone	110 - 280	6.4 - 92	N/A	
2-butanone	13 - 13	ND	N/A	
4-methyl-2-pentanone	6 - 170	ND	N/A	
benzene	8 - 36	1 - 2.2	5,100	A
toluene	5 - 120	3.6 - 14	5,000	C
ethylbenzene	2 - 54	4 - 12	430	A
total xylenes	3 - 90	2 - 50	N/A	
styrene	20 - 20	ND	N/A	
chlorobenzene	4 - 5	ND	129	C
1,1,1-trichloroethane	ND	1 - 6.3	31,200	A
1,1-dichloroethane	13 - 13	ND	N/A	
1,2-dichloroethane	2 - 47	ND	113,000	A
tetrachloroethene	2 - 64	1.8 - 30	450	C
trichloroethene	4 - 110	2 - 300	2,000	A
1,2-dichloroethene	3 - 620	1 - 2100	224,000*	A
1,1-dichloroethene	ND	ND	224,000*	A
vinyl chloride	6 - 190	600 - 600	N/A	
carbon tetrachloride	ND	2 - 2	50,000	A
chloroform	5 - 42	1 - 7.4	6,400*	C
methylene chloride	2 - 85	1 - 17	6,400*	C
chloromethane	ND	4 - 12	6,400*	C
1,2-dichloropropane	ND	1 - 1	3,040	C
bromodichloromethane	ND	2 - 2.4	N/A	
carbon disulfide	3 - 3	ND	N/A	

TABLE 1 (cont.)

RANGES OF CHEMICAL CONCENTRATIONS BY MEDIUM

CHEMICAL	GROUND WATER SAMPLES	SURFACE WATER SAMPLES	AWQC	
Acid Extractables				
2-methylphenol	4 - 4	ND	N/A	
Base/Neutral Extractables				
bis(2-ethylhexyl)phthalate	4 - 100	2.6 - 3.2	2,944*	A
di-n-octyl phthalate	2 - 4	ND	2,944*	A
di-n-butyl phthalate	5 - 23	2.2 - 460	2,944*	A
butylbenzyl phthalate	4 - 5	3.2 - 3.2	2,944*	A
acenaphthene	ND	2 - 2	710	C
benzo(g,h,i)perylene	2 - 2	ND	300*	A
benzo(a)pyrene	2 - 8	ND	300*	A
dibenzo(a,h)anthracene	2 - 2	ND	300*	A
fluoranthene	ND	2.2 - 2.2	16	C
indeno(1,2,3-cd)pyrene	2 - 2	ND	300*	A
naphthalene	2 - 4	ND	2,350	A
2-methylnaphthalene	ND	4 - 4	300*	A
pyrene	ND	2 - 2.2	300*	A
1,2-dichlorobenzene	4 - 18	54 - 54	1,970	A
benzyl alcohol	ND	2.8 - 3.2	N/A	
Pesticides/PCBs				
alpha-BHC	.15 - .15	ND	0.34	A
4,4'-DDT	ND	ND	0.13	C
4,4'-DDE	.04 - .28	ND	14	A
endosulfan sulfate	.36 - .36	ND	N/A	
chlordane	ND	.59 - .77	0.004	C
Arochlor(1260)	ND	3.5 - 3.5	0.03	C

CHEMICAL	SUBSURFACE SOIL SAMPLES	SEDIMENT SAMPLES
Volatiles		
acetone	130 - 750,000	14 - 870
2-butanone	2 - 1,200,000	20 - 340
2-hexanone	25 - 25	27 - 27
4-methyl-2-pentanone	8.5 - 2,700	14 - 20
benzene	3 - 3,800	4 - 640
toluene	1.2 - 2,800	1 - 6,000
ethylbenzene	7 - 3,100	1 - 4,300

TABLE 1 (cont.)

RANGES OF CHEMICAL CONCENTRATIONS BY MEDIUM

CHEMICAL	SUBSURFACE SOIL SAMPLES	SEDIMENT SAMPLES
Volatiles		
total xylenes	2.7 - 5,500	5 - 13,000
styrene	45 - 3,600	ND
chlorobenzene	3.4 - 270	2 - 5,000
1,1,2,2-tetrachloroethane	20 - 20	ND
1,1,1-trichloroethane	7.4 - 110	ND
1,1-dichloroethane	350 - 350	ND
1,2-dichloroethane	170 - 2000	ND
chloroethane	280 - 280	ND
tetrachloroethene	3.7 - 1,400	15 - 15
trichloroethene	4 - 32,000	15 - 15
1,2-dichloroethene	4 - 15,000	15 - 47
vinyl chloride	3 - 250	ND
chloroform	3.1 - 1,700	3.1 - 7.6
methylene chloride	34 - 630,000	6.2 - 180
chloromethane	250 - 250	ND
bromomethane	160 - 160	ND
carbon disulfide	1.6 - 130	3.7 - 23
Acid Extractables		
phenol	800 - 4,800	ND
2-methylphenol	500 - 680	ND
4-methylphenol	94 - 6,000	ND
2,4-dimethylphenol	60 - 720	1,700 - 1,700
Base/Neutral Extractables		
bis(2-ethylhexyl)phthalate	54 - 5,000	670 - 42,000
di-n-octyl phthalate	51 - 1,300	260 - 1,200
di-n-butyl phthalate	49 - 25,000	45 - 19,000
diethyl phthalate	990 - 990	ND
butylbenzyl phthalate	1,900 - 6,000	340 - 7,100
acenaphthene	40 - 760	110 - 27,000
acenaphthylene	320 - 320	110 - 3,400
anthracene	79 - 1,300	230 - 16,000
benzo(a)anthracene	51 - 2,500	110 - 20,000
benzo(b)fluoranthene	66 - 3,100	255 - 13,000
benzo(k)fluoranthene	57 - 3,100	330 - 17,000
benzo(g,h,i)perylene	40 - 770	190 - 1,700
benzo(a)pyrene	47 - 2,000	130 - 17,000
chrysene	51 - 2,200	580 - 13,000
dibenzo(a,h)anthracene	350 - 350	220 - 470

TABLE 1 (cont.)

RANGE OF CHEMICAL CONCENTRATIONS BY MEDIUM

CHEMICAL	SUBSURFACE SOIL SAMPLES	SEDIMENT SAMPLES
Base/Neutral Extractables		
fluoranthene	60 - 5,300	1,000 - 35,000
fluorene	44 - 850	140 - 21,000
indeno(1,2,3-cd)pyrene	40 - 750	170 - 1,400
naphthalene	62 - 1,600	110 - 51,000
2-methylnaphthalene	49 - 800	43 - 27,000
phenanthrene	66 - 6,000	170 - 61,000
pyrene	100 - 4,100	190 - 22,000
1,2-dichlorobenzene	40 - 1,000	620 - 10,000
1,3-dichlorobenzene	ND	110 - 510
1,4-dichlorobenzene	ND	95 - 7,100
1,2,4-trichlorobenzene	80 - 590	ND
N-nitrosodiphenylamine	80 - 80	400 - 400
4-chloroaniline	ND	300 - 4,200
benzoic acid	380 - 380	ND
benzyl alcohol	80 - 630	ND
bis(2-chloroethoxy)methane	94 - 94	ND
dibenzofuran	290 - 740	100 - 13,000
isophorone	230 - 1,700	ND
Pesticides/PCBs		
4,4'-DDT	38 - 38	19 - 970
4,4'-DDD	ND	20 - 420
4,4'-DDE	12 - 24	17 - 340
dieldrin	ND	210 - 210
Arochlor(1242)	ND	5,100 - 5,100
Arochlor(1254)	40 - 973	440 - 440
Arochlor(1260)	6,000 - 6,000	5,200 - 5,200

* Ambient Water Quality Criteria marked with an asterisk represent the total allowable concentration for the sum of all of the contaminants in that particular chemical class.

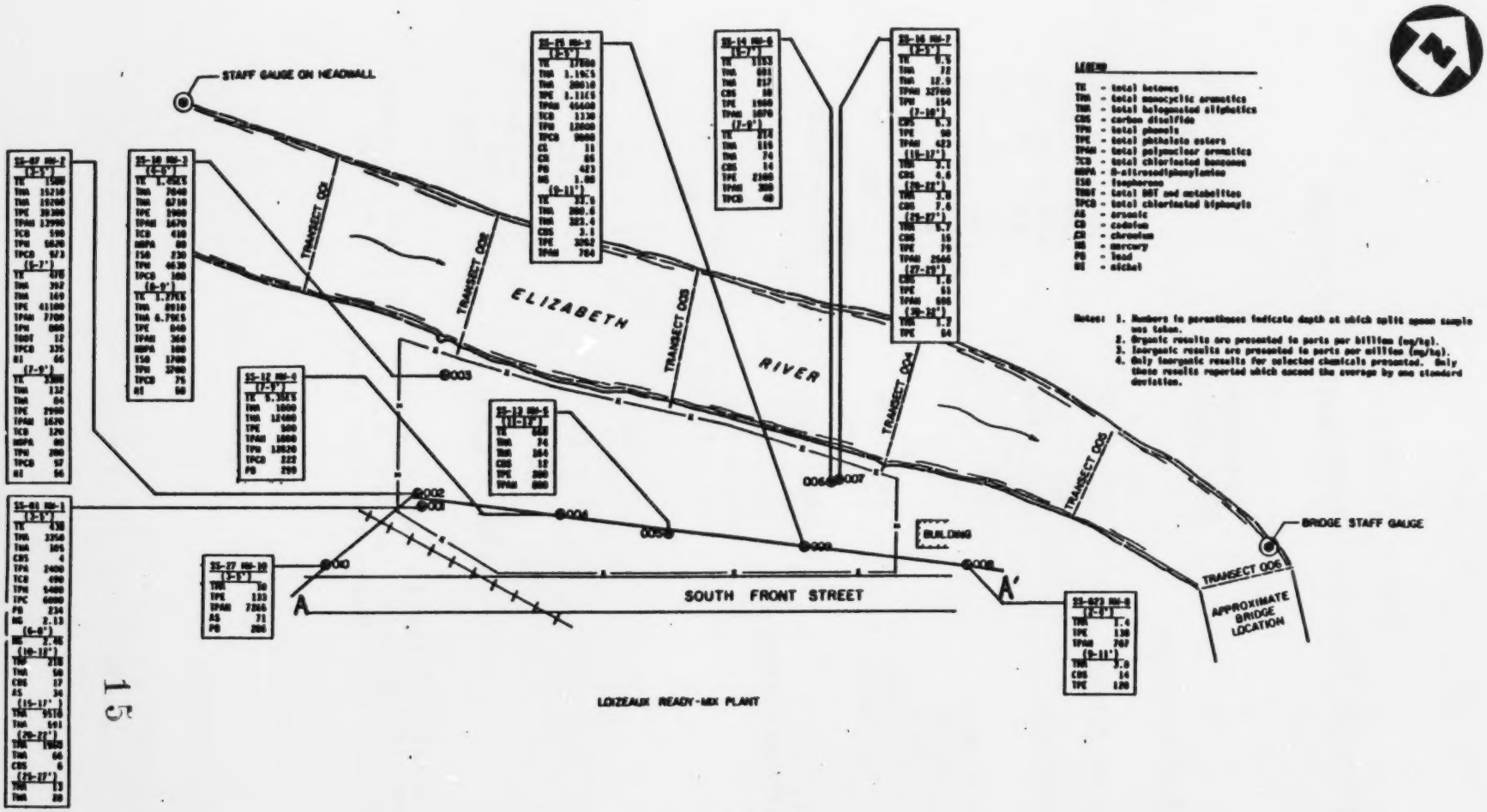


FIGURE 2

ANALYTICAL RESULTS - SUBSURFACE SOIL SAMPLES
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

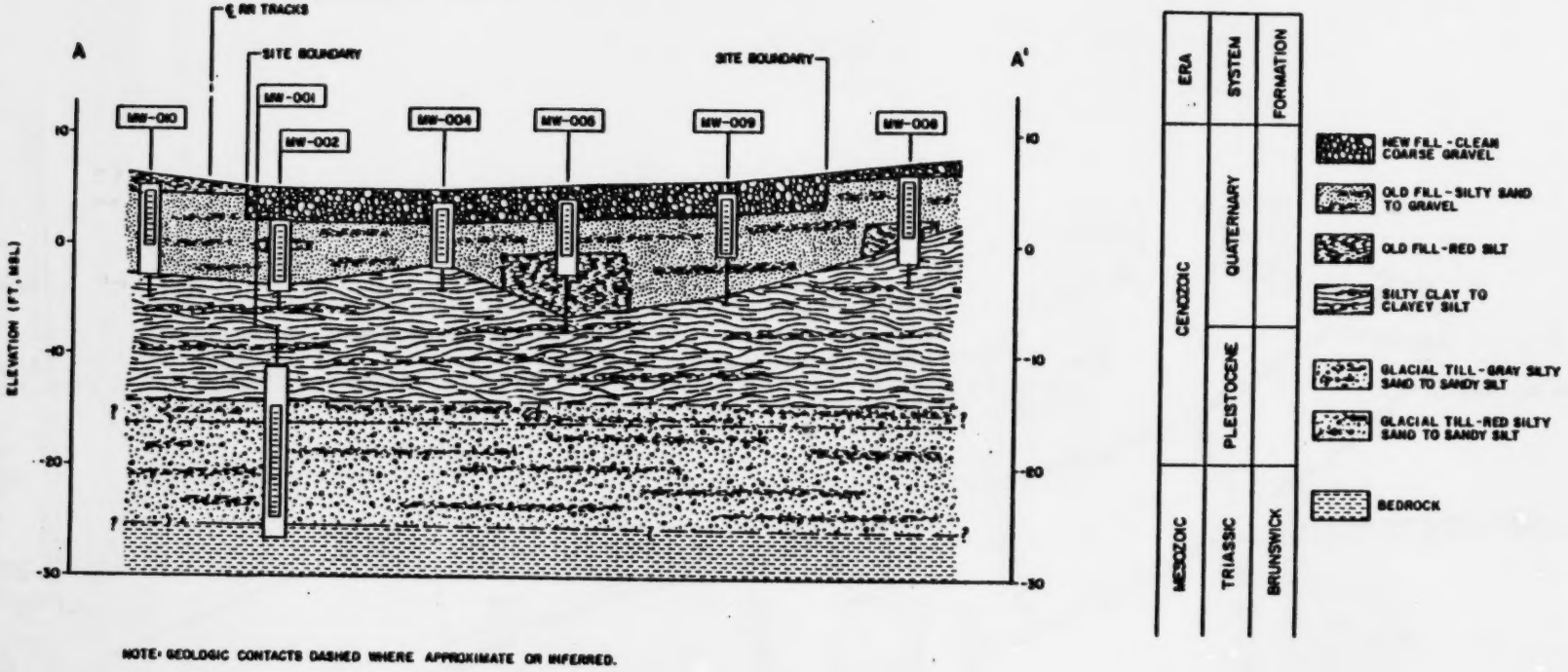


FIGURE 3

GEOLOGIC CROSS SECTION A-A'
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

This cross section is based on findings from the borings for monitoring wells 1,2,4,5,8,9, and 10. (see Figure 2, line A-A')

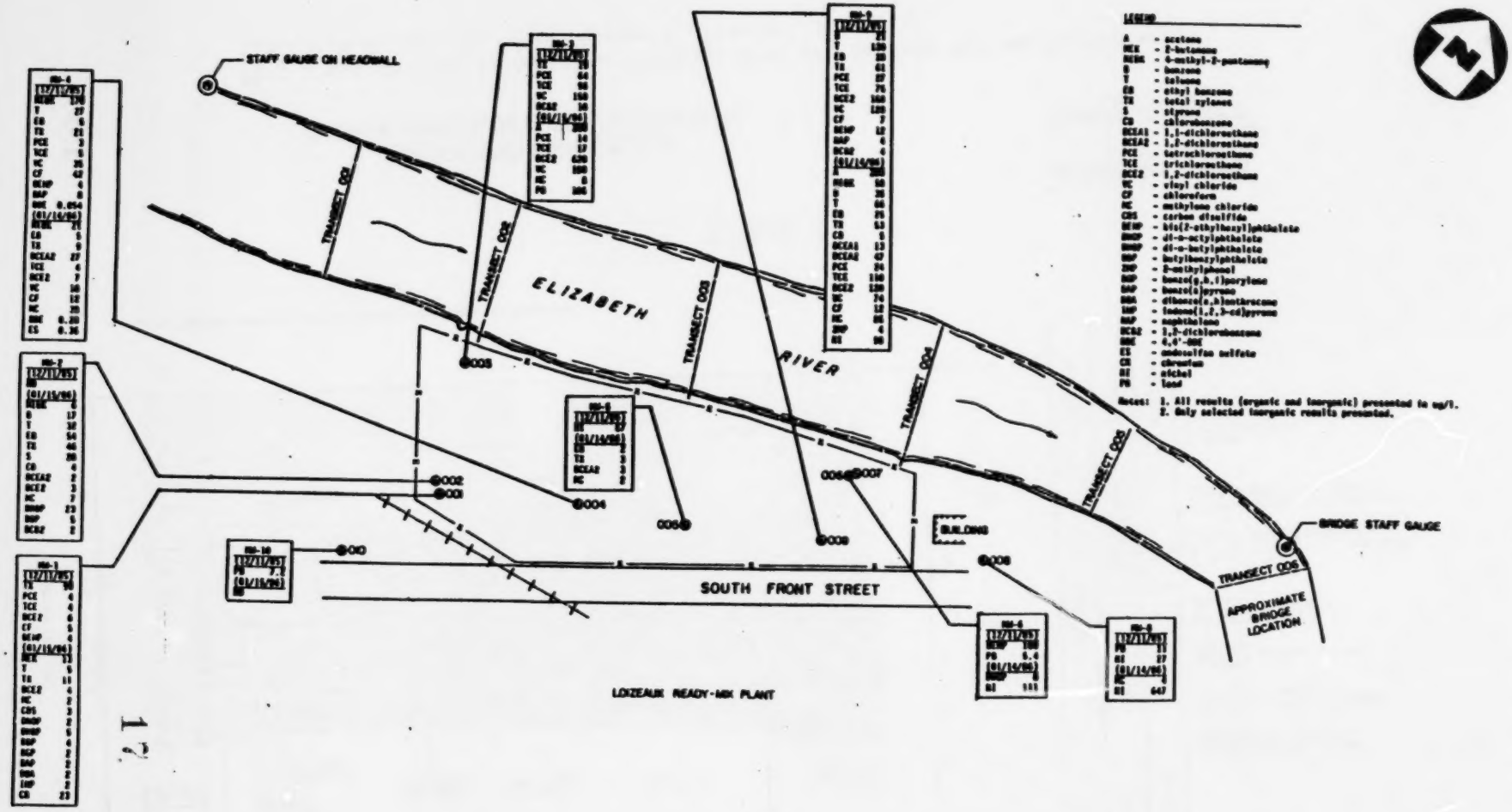


FIGURE 4

ANALYTICAL RESULTS-GROUNDWATER SAMPLES
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

The data for chemical concentrations in the river sediment samples fail to show any trend linking the contaminants to the site. This is probably because there are so many other potential sources of contamination along the river. The river is lined with junk yards, oil tank farms, and chemical manufacturers, and storm water runoff from much of the city's streets carries oil and other contaminants into the river. Although Chemical Control was probably a source of contamination to the river at one time and it continues to leach some contaminants, there are many other sources of contamination along the river.

The Elizabeth River and the Arthur Kill are both polluted, unhealthy environments. Contact with sediments in both surface water bodies would expose an individual to potentially dangerous levels of hazardous substances. Recreational boaters and fishermen (despite State-imposed restrictions on shellfishing) use both the Elizabeth River and the Arthur Kill, so direct contact with sediments as well as ingestion of contaminated shellfish are both potential exposure routes.

Objectives for remedial action were developed based on the findings of the risk assessment and the presence of highly contaminated soils at the site. The high levels of contaminants in the soil represent the greatest potential risk to public health and the environment. Therefore, the remedial action for this site should reduce the mobility and toxicty of the contaminants in the soil. To the greatest extent possible, the action should protect against any possibility of the contaminated soils being exposed, it should insure that the leaching of contaminants will not increase, and it should return the site to a condition that is compatible with future development that could reasonably be expected in this industrial area. Remediation of the river sediments was not identified as an objective of this action. The site is no longer a significant source of this contamination, and other sources continue to contaminate the river. It would be premature to consider remedial actions for the river sediments while major, active sources of this contamination exist.

ENFORCEMENT

Notice letters were sent to 31 parties identified as generators of wastes disposed of at the site on August 17, 1987. The EPA held a conference on August 26, 1987 for recipients of the notice letters to provide information about its proposed activities at the site, to answer questions, and to invite a discussion of a settlement that would involve funding of the proposed activities by private parties. Informal discussion of a possible settlement is expected to continue, and it may lead to more formal negotiations.

COMMUNITY RELATIONS ACTIVITIES

The RI report was released to the public on 29 July 1986. The FS report and the Proposed Remedial Action Plan, which identified the EPA's preferred remedial alternative, were released on 30 June 1987 and 2 July 1987, respectively. A reprint of the RI was released at the same time to ensure that a complete package of site information was available. The RI and FS reports were placed in public repositories on these respective dates. The public comment period, initiated on this date, was open until 14 August 1987.

A public meeting was held on 6 August 1987 to present the study and the Proposed Remedial Action Plan and solicit public input. The issues raised during the comment period are addressed in the Responsiveness Summary, which is attached to this document.

DESCRIPTION OF REMEDIAL ALTERNATIVES

This section describes the remedial alternatives that were identified and assembled using suitable technologies in order to meet the objectives of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). These alternatives were developed by screening a wide range of technologies for their applicability to site-specific conditions and evaluating them for effectiveness, implementability, and cost.

ALTERNATIVE 1: NO ACTION

The No Action alternative does not include any remedial action to address the contaminants in the subsoil. However, it does include groundwater monitoring to provide an early warning of any increase in leaching of contaminants into the groundwater. It also includes repairing the berm between the site and the Elizabeth River, removing all debris remaining at the site, and sealing a sanitary sewer line that leads from the site to the storm sewer line under South Front Street.

All of the remaining remedial alternatives also include monitoring the groundwater, repairing the berm, sealing the sanitary sewer line connection, and removing the trash.

ALTERNATIVE 2: CONTAINMENT

This alternative includes construction of a groundwater barrier, either a slurry wall or a sheet pile wall, and a multimedia cap. The containment system would reduce the flow of water through the site, thereby reducing the migration of contaminants from the site. It would also offer some protection from the release of contaminants that would occur if the contaminated soil were exposed.

ALTERNATIVE 3: IN-SITU SOIL WASHING

This alternative includes the construction of a groundwater barrier and an active soil washing system. Groundwater would be extracted through wells, treated using an air stripper and carbon treatment system, and recirculated by spray irrigation (Figure 5). A modified system, using a surfactant or solvent to expedite the removal of contaminants from the soil, a treatment system appropriate for the additive used, and reinjection wells instead of spray irrigation, was also developed as an option within this alternative. The groundwater barrier is required to keep water from the river and the aquifer surrounding the site from entering the treatment system and to keep any additives used from leaving the site. After the soil washing is completed, it would protect the clean soil from being contaminated by the surrounding environment. The objective of this action is to remove the contaminants from the soil, thereby eliminating the potential for futher leaching of contaminants from the soil or exposure to contaminants from the soil.

ALTERNATIVE 4: IN-SITU FIXATION

This alternative involves drilling through the gravel cover at the site with an expandable bit drill rig (Figure 6). The contaminated soil zone is penetrated by the drill bit, which is then expanded. The fixation chemicals are then injected into the column of soil and mixed. A series of overlapping columns would be formed converting all of the contaminated soil at the site into a solid mass (Figure 7). This would inhibit water from flowing through the site, thereby preventing the production of leachate. In addition, some contaminants may be chemically altered and incorporated in the the solid matrix formed by this action, reducing the toxicity as well as the mobility of the contaminants. The potential for exposing the contaminated soil would be eliminated.

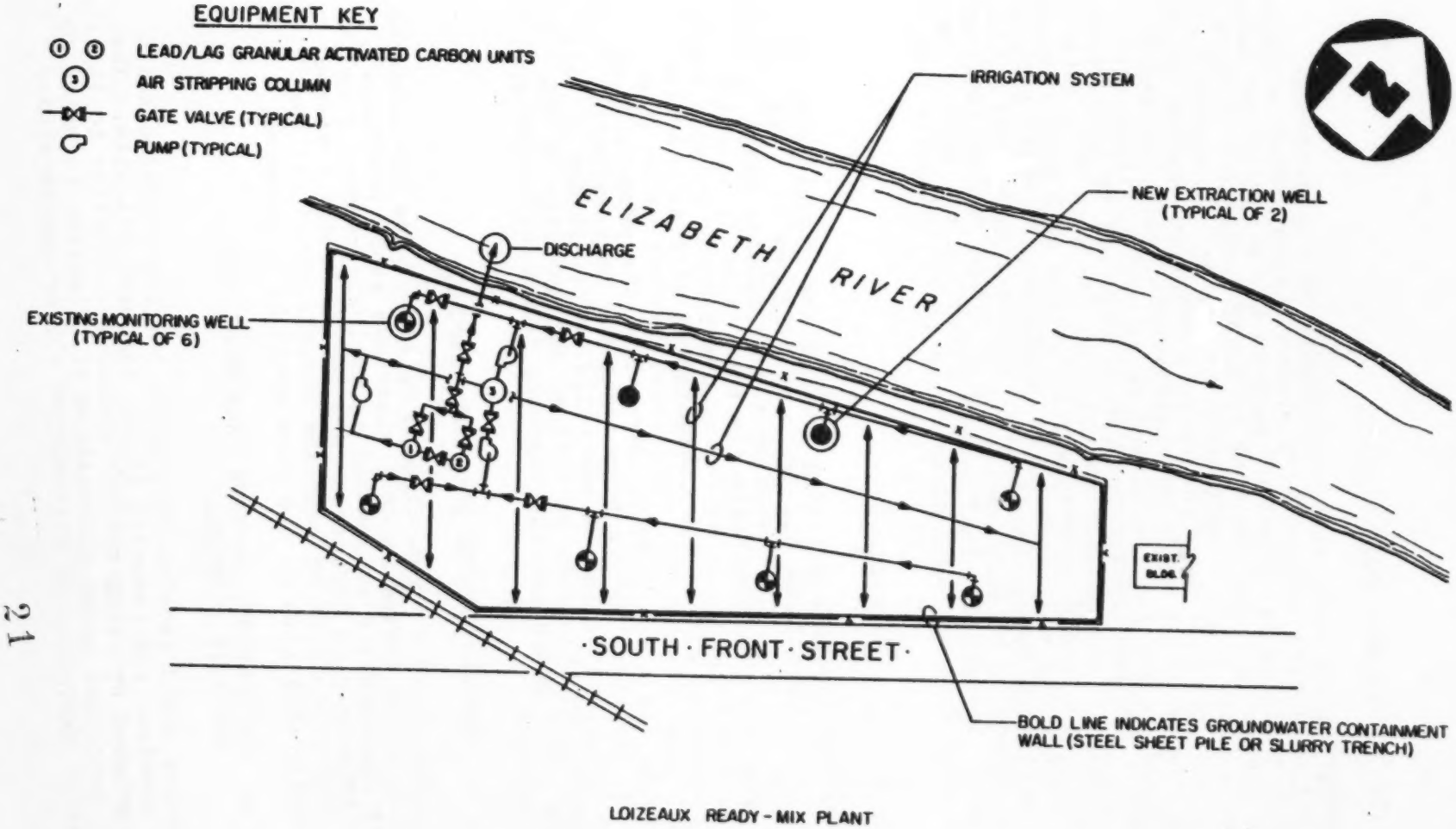
ALTERNATIVE 5: EXCAVATION AND OFF-SITE DISPOSAL

This alternative would involve digging up all of the contaminated soil at the site and taking it to a hazardous waste landfill. Although the contaminated soil would be entirely removed from the site, it would merely be deposited in a secure landfill without treatment. The production of leachate and the potential for exposing contaminated soil at the site would be eliminated.

ALTERNATIVE 6: EXCAVATION, ON-SITE TREATMENT, AND OFF-SITE DISPOSAL

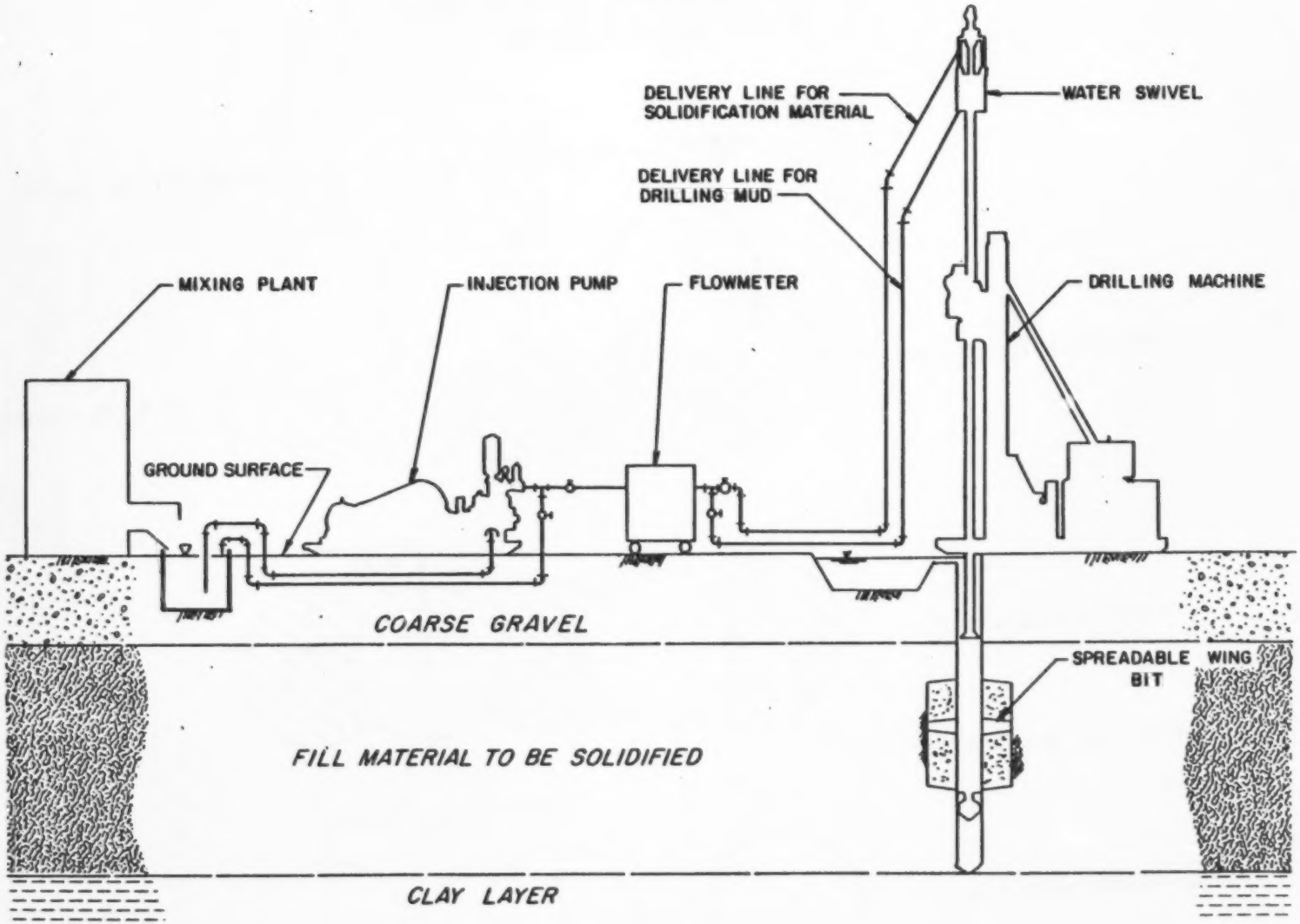
This alternative would involve excavating the contaminated soil, treating it on-site, and removing it for disposal off-site. The soil may be treated by using solvent extraction (similar to in-situ soil washing described under Alternative 3), fixation (similar to in-situ fixation described in Alternative 4), or incineration.

FIGURE 5


EQUIPMENT KEY
① ② LEAD/LAG GRANULAR ACTIVATED CARBON UNITS
③ AIR STRIPPING COLUMN
GATE VALVE (TYPICAL)
PUMP (TYPICAL)
IRRIGATION SYSTEM
NEW EXTRACTION WELL (TYPICAL OF 2)
ELIZABETH RIVER
DISCHARGE
EXISTING MONITORING WELL (TYPICAL OF 6)
EXIST. BLDG.
·SOUTH · FRONT · STREET·
BOLD LINE INDICATES GROUNDWATER CONTAINMENT WALL (STEEL SHEET PILE OR SLURRY TRENCH)
LOIZEAUX READY-MIX PLANT

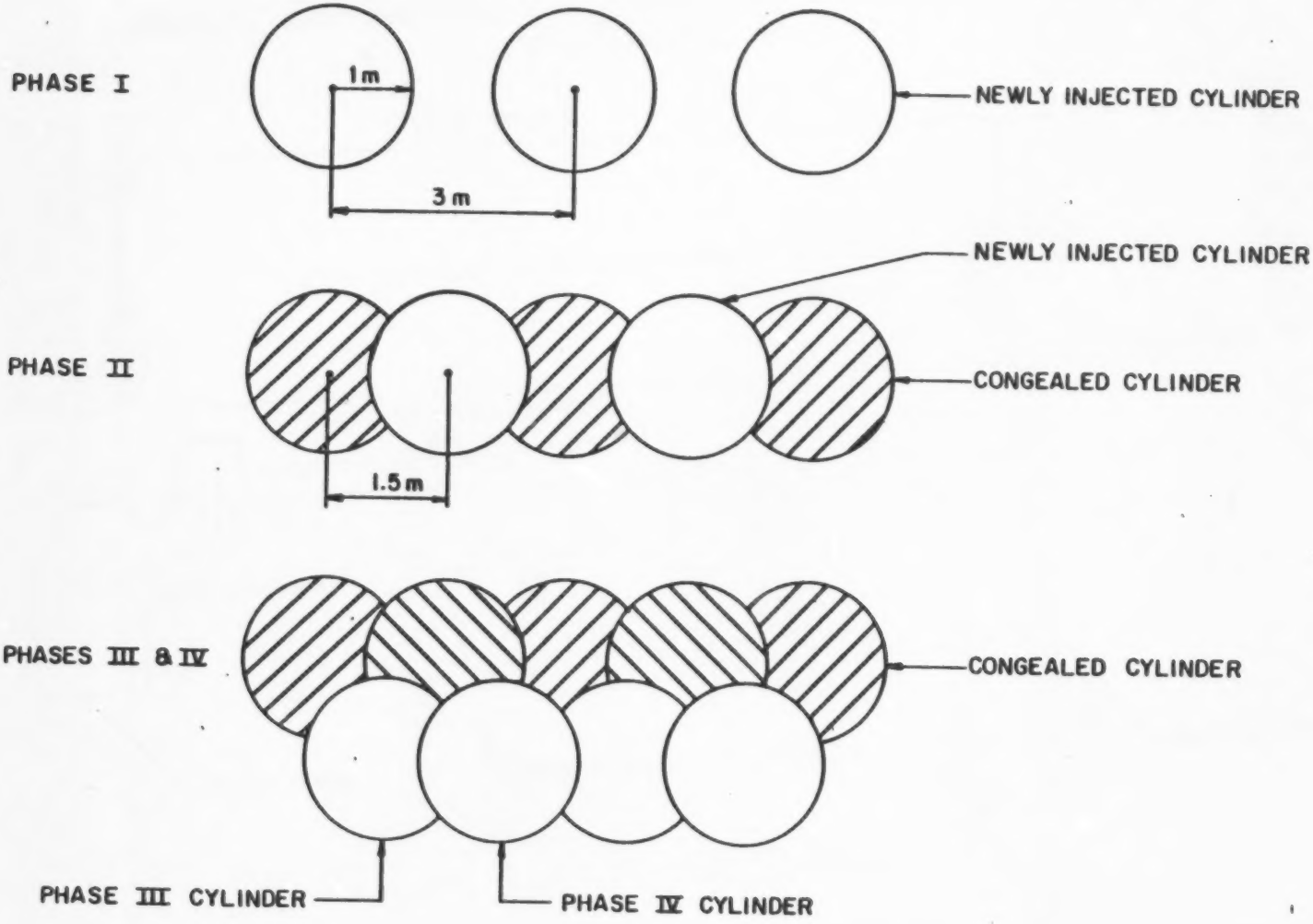
ALTERNATIVE Nº 3:
GROUNDWATER EXTRACTION/SOIL FLUSHING SYSTEM
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ
SCALE: 1"=100'

FIGURE 6



ALTERNATIVE Nº 4
GENERAL ARRANGEMENT FOR "SWING" IN-SITU SOLIDIFICATION METHOD
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

FIGURE 7



ALTERNATIVE Nº 4
LOGISTICS OF INJECTION PROCEDURE
CHEMICAL CONTROL CORP. SITE, ELIZABETH, NJ

Under this alternative, the soil extraction and solidification would be above ground and not in-situ as in Alternatives 3 and 4. It is assumed that the treated soil would no longer qualify as a hazardous waste (ie. it would pass a clean closure analysis), and it could therefore be removed to a sanitary landfill for disposal. This assumption would have to be confirmed during design. This alternative would satisfy the remedial objectives by removing and treating the contaminants.

ALTERNATIVE 7: EXCAVATION, ON-SITE TREATMENT, AND ON-SITE DISPOSAL

This alternative is identical to Alternative 6 except the treated soil would be retained at the site for disposal. This alternative was developed in the FS assuming the treated soil could pass a clean closure analysis and be returned to the excavation. If this is not the case, the material would have to be taken to a hazardous waste landfill at a much greater cost. Disposal of hazardous waste at the site was not considered an acceptable alternative because of its small size and its location in a flood plain.

ALTERNATIVE 8: EXCAVATION, OFF-SITE INCINERATION AND DISPOSAL

This alternative would involve excavating the contaminated soil and removing it to an off-site facility for incineration and disposal of the ash. The excavated material would be replaced with clean fill. As in the Excavation with Off-site Disposal Alternative, the remedial objectives would be satisfied by total removal of the contaminants.

EVALUATION OF ALTERNATIVES

Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, the EPA must develop and evaluate a range of remedial action alternatives for each site on the National Priorities List. The six major criteria used are: degree of protection provided and relative reduction of mobility, toxicity, or volume of contaminated material (effectiveness), technical feasibility, administrative feasibility, and availability of resources and facilities for disposal or treatment (implementability), and cost. These six factors are considered over both the short term -- i.e., through remedial construction and initial operations -- and the long term, which represents the final status of the site when any operation and maintenance functions involved have ceased.

Table 2 indicates the various levels of evaluation criteria and the interrelationships between them. The following text discusses each alternative relative to the elements of these evaluation criteria. Those elements not discussed in detail in the text are either the same for all or most of the alternatives, or are considered to be adequate or at least comparable to similar aspects of other options. The text focuses on the most significant elements of each option. The capital and operation and maintenance costs of all of the remedial alternatives are presented in Table 3.

TABLE 2

EVALUATION FACTORS FOR REMEDY SELECTION

	EFFECTIVENESS		IMPLEMENTABILITY			COST
	Protectiveness	Reduction of Toxicity, Mobility, or Volume	Technical Feasibility	Administrative Feasibility	Availability	Capital and O&M
SHORT TERM ASPECTS	Reduction of existing risks Compliance with some ARARs Compliance with some criteria, advisories, and guidances Protection of community and workers during remedial actions Time until protection is achieved	Immediate or short-term reduction in toxicity, mobility, or volume	Ability to construct technology Short-term reliability of technology Compliance with some ARARs (primarily action-specific)	Ability to obtain approvals from other agencies Likelihood of favorable community response Need for coordination with other agencies Compliance with some location-specific ARARs Relative demand on available resources within EPA	Availability of treatment, storage, and disposal services and capacity Availability of necessary equipment and specialists	Development and construction costs Operating costs to implement remedial action Other capital and short-term costs required to complete remedial action
LONG TERM ASPECTS	Magnitude of residual risk Long-term reliability Compliance with some ARARs or TBCs Likelihood of future exposure to residuals Potential need for replacement	Permanent and significant reduction in toxicity, mobility, or volume	Ease of undertaking additional remedial action, if necessary Ability to monitor effectiveness of remedy Ability to perform operation & maintenance functions			Operation and maintenance costs, for as long as necessary Costs of 5-year reviews Potential future remedial action costs

TABLE 3

CAPITAL AND ANNUAL OPERATION AND MAINTENANCE COSTS

Alternative	Capital Cost ($1000)	Annual O&M Cost ($1000)		Present-Worth Cost ($1000)
1. No Action	53.4	87.4	22.9	415
2. Containment	1,168	71.4	29.4	1,411
3. In-situ Soil Washing	1,297	339.5	275.0	4,026
4. In-situ Fixation	7,208	57.4	22.4	7,425
5. Excavation Off-site Disposal	8,781	57.4	-	8,999
6. Excavation & On-site Treatment & Off-site Disposal				
a. Fixation	18,986	57.4	-	19,204
b. Soil Washing	27,349	57.4	-	27,567
c. Incineration	34,000	57.4	-	34,218
7. Excavation & On-site Treatment & On-site Disposal				
a. Fixation	14,326	57.4	22.4	14,544
b. Soil Washing	14,311	57.4	22.4	14,528
c. Incineration	22,045	57.4	-	22,262
8. Excavation Off-site Incineration	34,931	57.4	-	35,149

The first figure given for Annual Operation and Maintenance (O&M) cost represents the annual cost for each of the first five years plus the cost of re-evaluating the site after five years as required by the Superfund Amendments and Reauthorization Act. The second figure in this column represents annual O&M cost for years 6 through 30 including periodic monitoring and site re-evaluations at five year intervals.

Each alternative will be discussed with regard to two major categories - effectiveness and implementability - from both short- and long-term perspectives. The discussions of criteria will follow the same order as that given in the tables. Those included in every alternative discussion, to ensure consistency and minimize subjectivity.

ALTERNATIVE 1: NO ACTION

The No Action Alternative would leave approximately 18,000 cubic yards of highly contaminated soil at the site without reducing its mobility, toxicity, or volume. This soil would continue to leach organic contaminants into the groundwater. In addition, the risk assessment found that exposing the soil would present significant health risks via dermal contact and inhalation of contaminants that have volatilized or have adhered to fugitive dust. Alternative 1 would not address the ongoing problem of contaminant migration in the groundwater or the more significant potential problem of exposure of the contaminated soils. It would also allow a large volume of contaminated soil to remain at the site in violation of guideline concentrations under New Jersey's Environmental Cleanup Responsibility Act (ECRA).

ALTERNATIVE 2: CONTAINMENT

Containment would also allow the contaminated soil to remain at the site. However, migration of contaminants would be mitigated by installing a groundwater barrier and a cap. This containment system would offer increased protection over existing conditions. It could be implemented using standard construction practices, and because relatively small volumes of contaminated soil would be exposed at any one time, it should be easy to protect against releases during construction. A disadvantage to this alternative is that the combination of highly contaminated soil and saline, tidally influenced groundwater may weaken the wall and, in time, it may need to be replaced. The containment system would offer effective protection if institutional controls were imposed to prohibit any future digging at the site.

ALTERNATIVE 3: IN-SITU SOIL WASHING

In-situ Soil Washing is intended to remove the bulk of the contaminants from the site, thereby eliminating the threat of exposure of highly contaminated soil or migration of contaminants. However, the contaminants are tightly bound to the soil, so flushing with groundwater alone would take a very long time to achieve its goal and may still leave a concentrated residue of contaminants in the soil. Surfactants or solvents could be recirculated through the site to expedite the removal of contaminants, but the use of such chemicals would increase the cost of the alternative. The use of these additives would also increase the danger of contaminants escaping the temporary containment system because the mobility of

the contaminants must be increased to remove them by soil washing. A treatability study would be needed during design to determine the best method and additives for soil washing.

The containment, groundwater extraction, and treatment systems should be relatively easy to construct. Monitoring wells, which were installed during the RI, may be used as extraction wells. Additional extraction wells that may be needed will be shallow and should be easily installed. The water treatment system is a standard package plant that is generally available. Disposal or regeneration of spent carbon from the water treatment system is part of the operation cost of this alternative. If chemical additives are used to facilitate soil washing, injection wells and a more sophisticated treatment plant would be required. At the end of the soil washing phase, the containment system will need to be maintained to protect against the release of any residual contaminants or the recontamination of the site from surrounding groundwater or surface water.

Although the ultimate goal of this alternative is to reduce the risk at the site by removing contaminants, the mobility of the contaminants (and therefore the potential for contaminant release) must be increased during the operation phase of this alternative to achieve this goal. Protection against flooding during the years that the system would be operated must be a top priority. Flooding happens occasionally at the site now and must be prevented during the remedial action to avoid releases of contaminated material and damage to equipment. In-situ operations are generally less susceptible to damage by flooding than excavation, because it is not necessary to expose a large area of contaminated soil. However, since this alternative would take many years to complete, the likelihood of a flood occurring during remediation is higher.

ALTERNATIVE 4: IN-SITU FIXATION

In-situ Fixation is intended to eliminate the potential for exposing the contaminated soil and to reduce the leaching of contaminants. This would be accomplished by solidifying the contaminated soil. The permeability of the soil would be significantly reduced by the solidification process, which would virtually eliminate the infiltration of surface water and the flow of groundwater through the site. The mobility of the contaminants would be significantly reduced, since the groundwater cannot be contaminated if it does not come into contact with the waste. The leaching of contaminants may also be reduced by a reaction of the fixation chemicals with the contaminants, which would chemically bind some contaminants to the solid matrix making them resistant to leaching even in a very harsh chemical environment. The toxicity of other contaminants may also be reduced by this chemical reaction.

As with all of the alternatives that involve treatment, a treatability study would be required during the design of the remedial action, to determine the most cost-effective fixation process.

Although in-situ fixation is not yet a standard construction practice, several vendors are available that provide this service. Chemical fixation has been used extensively to treat industrial wastes, and the in-situ process described in this document is currently being studied for use at other hazardous waste sites.

The danger of exposure to or a release of hazardous substances is especially low for this alternative because it is performed using in-situ operations and the time to implement it is relatively short. The long-term reliability of this alternative is especially promising. Unlike the containment system in Alternative 2, which would encase contaminated material in an impermeable skin (cap and wall), the entire site would be converted into a solid mass. This alternative would also incorporate the contaminants into the containment structure rather than simply enclosing the waste. Therefore, the likelihood of contaminants escaping the system or new contaminants entering the system would be virtually eliminated. The solid form of the fixated soil would also resist water infiltration, which could reintroduce contaminants to the site in those alternatives where the soil is cleaned but not contained.

ALTERNATIVE 5: EXCAVATION AND OFF-SITE DISPOSAL

Excavation and Off-site Disposal would remove all of the contaminated soil from the site. From the perspective of the site itself, this alternative provides significant and immediate risk reduction since all of the contaminated material would be removed. However, off-site disposal of contaminated material from a Superfund site without treatment is described in the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, as "the least favored alternative remedial action where practicable treatment technologies are available." Excavating contaminated soils and transporting them to a landfill without reducing the mobility, toxicity, or volume of the material merely transports the public health and environmental problems to another location. A disadvantage to creating a pristine site at Chemical Control is that it may become recontaminated by the area surrounding it.

Excavation at this site would be complicated by several physical conditions. Special construction practices would have to be employed because of the high water table, the proximity of the river, and the tidal action. Special precautions would also be required because the site is in a flood plain.

The small size of the site (2.2 acres) also presents a problem of working within a small area. Because the site is surrounded by active industrial properties and the Elizabeth River, equipment for the implementation of the remedy must be confined to the site or operated from barges adjacent to the site. As a result, small areas of the site will have to be excavated while the rest of the property is used to house equipment, a loading area for trucks to remove the contaminated material, and a decontamination zone.

Excavating many small cells would leave more room at the site for other equipment and make it easier to prevent contaminant releases during excavation. However, it would increase the time and cost of the alternative.

Another short-term hazard posed by this alternative is the inconvenience and danger from the increased volume of heavy truck traffic. South Front Street already accommodates a very heavy volume of truck traffic during business hours. The additional traffic may require special traffic controls. Fortunately, the site is very close to several major transportation routes, including interstate highways, which would reduce the need to use local roads and would facilitate the action.

ALTERNATIVE 6: EXCAVATION, ON-SITE TREATMENT, AND OFF-SITE DISPOSAL

Excavation, On-site Treatment, and Off-site Disposal would also remove all of the contaminants from the site thereby eliminating the hazards at the site. The same short-term hazards posed by Alternative 5 would also apply to this alternative. The logistics problem is even worse for this alternative, because a treatment system would also be needed at the site.

The advantage of this alternative over Alternative 5 is that the soil would be treated before it was removed from the site. The cost developed in the FS for this alternative assumed that the treated soil would not require disposal as a hazardous waste. If the treated soil cannot be delisted as a hazardous waste, it will have to be removed to a hazardous waste facility at a much greater cost. A treatability study would be required during design to help define the cost-effective treatment process and the nature of the treated waste.

ALTERNATIVE 7: EXCAVATION, ON-SITE TREATMENT AND DISPOSAL

Excavation, On-site Treatment and Disposal would achieve a level of protection and risk reduction similar to the in-situ treatment alternatives presented above. Two of the treatment options incorporate the same technologies as the in-situ treatment alternatives: soil washing and fixation. The advantage of excavating the material before treating it is that treatment above ground can be directly observed and the treated soil can be analyzed before returning it to the site. The third treatment option, incineration, is not possible for an in-situ operation. It achieves nearly total destruction of the organic contaminants, but metals would remain in the soil. The short-term hazards associated with this alternative are similar to those for other excavation alternatives. Soil that has been treated using soil washing or incineration may become recontaminated by the surrounding environment since it would be returned to the site.

The logistics problem associated with this alternative is similar to that for Alternative 6. Although a loading zone will not be required since treated soil will not be removed from the site, contaminated soil would have to be stored in one area before treatment and treated soil would have to be stored in a separate area awaiting testing and replacement in the excavation pit. The logistics problem may be solved by excavating small cells, although this would increase the cost and time to implement this alternative. The cost of this alternative is lower than the cost of Alternative 6, reflecting the savings from not having having to transport the 18,000 cubic yards of material, but higher than the cost of similar in-situ treatment.

ALTERNATIVE 8: EXCAVATION, OFF-SITE INCINERATION AND DISPOSAL

Excavation, Off-site Incineration and Disposal would remove all of the contaminated soil from the site. Unlike Alternative 5, discussed previously, the excavated soil would be incinerated to destroy organic contaminants before landfilling. This is the most expensive alternative and does not offer a significantly greater level of protection than any of the other treatment alternatives.

The short-term hazard of release of contaminants and the logistics problems are the same for this alternative as for the Excavation with Off-site Disposal - Alternative 5. As with Alternative 7, it is possible that clean soil used to fill the site may be recontaminated by the surroundings if a containment system is not installed.

SELECTED REMEDY

After review and evaluation of the remedial alternatives presented in the FS, the EPA presented the In-situ Fixation Alternative (Alternative No. 4) to the public as the preferred final remedy for the site. Based on the input received during the public comment period, this alternative has been selected by the EPA and the NJDEP as the final permanent solution for the site.

This alternative involves treating the approximately 18,000 cubic yards of contaminated soil with fixation chemicals that will create a solid matrix that will have extremely low permeability. One method for accomplishing this is to drill through the gravel and into the contaminated soil with an expandable bit drill rig. The bit is expanded in the contaminated soil zone and the soils are mixed while fixation chemicals are delivered. This process is illustrated in Figure 6. All of the contaminated soil at the site will be converted into a series of overlapping columns of treated soil. The stratum of contaminated soil is approximately ten feet thick and extends from the bottom of the gravel layer, approximately three feet below grade, to the top of the clay layer.

The remedy also includes repairing the berm that separates the site from the Elizabeth River, removing debris remaining from previous response activities, and sealing the sanitary sewer line under the site where it connects with the South Front Street storm sewer. In addition, environmental samples will be collected to monitor the effectiveness of the remedy.

Performance Goals

The major threat to public health and the environment is from potential contact with exposed contaminated soil and potential migration of contaminants from the site into the Elizabeth River. In-situ Fixation, as a source control measure, would incorporate all of the contaminants in a solid matrix that would significantly reduce, if not eliminate, the mobility of the contaminants and the risk of contact with contaminants in the soil. In addition, some contaminants may be bound to this solid matrix such that leachate production would be virtually, if not totally, eliminated.

The contaminants found in the Elizabeth River sediments indicate that while the Chemical Control site may have been a past contributor to this contamination, other major sources still exist. Until these sources are identified and subsequently mitigated, remediation of the river sediments is premature. Similarly, the contaminants found in the surface water indicate that leachate from the Chemical Control site has an undetectable influence and that other, active sources exist. Therefore, remediation of the surface water is also premature. Before remediation of the Elizabeth River could be effective, an overall management scheme of these sources would have to be implemented.

The recommended alternative would treat all of the 18,000 cubic yards of contaminated soil at the site using in-situ fixation. The implementation should take approximately 10 to 12 months and should begin approximately 18 to 20 months after the signing of this Record of Decision. The remedial design, which should take 12 to 18 months to complete, will begin as soon as possible after the Record of Decision is signed. However, it is anticipated that negotiations with potentially responsible parties for assumption of responsibility for the remedial design and action may delay the initiation of the design by as much as four months.

Protectiveness

The short- and long-term protectiveness of all of the remedial alternatives were compared using the evaluation factors provided in the first column of Table 2. This remedy does not introduce any significant health or environmental risks during implementation (short-term protectiveness factors) and offers a level of long-term protection comparable to or exceeding that of any of the other alternatives. The short-term risks are reduced by utilizing in-situ operations that will not expose the contaminated soil. In comparison to In-situ Soil Washing, this remedy will be completed

relatively quickly so full protection will be achieved quickly, and extended operations at the site will not be necessary.

No Applicable or Relevant and Appropriate Requirements (ARARs) are currently being violated at the site. The following section examines ARARs in more detail. The On-site Treatment alternatives and the In-situ Soil Washing alternative might temporarily violate Executive Order 11988 on Management of Floodplains by requiring the construction of a treatment system in a floodplain. The In-situ Fixation alternative will involve a relatively quick on-site operation, which because it is implemented primarily below ground, offers protection against releases during a flood.

The In-situ Fixation alternative should provide durable, effective protection from contaminant release. Although such an application of this technology is fairly new, promising results have been obtained in laboratory tests, and it is being tested at other hazardous waste sites and evaluated under the Superfund Innovative Technology Evaluation program. The Chemical Control project will benefit from the experience gained at these sites.

Consistency with Other Laws

The Solid Waste Disposal Act, otherwise known as the Resource Conservation and Recovery Act (RCRA), as amended, is the federal legislation regulating hazardous waste that is generally the most significant ARAR for Superfund actions. The soil at the Chemical Control site was contaminated during the operation of the site in the 1970's and during the fire in 1980. The RCRA does not apply to the site because it did not operate under a permit issued pursuant to this act: industrial activities ended at the site before 1982 when the EPA began issuing such permits.

The selected remedy was evaluated for compliance with the RCRA as a relevant and appropriate requirement by considering a hypothetical site similar to Chemical Control except that it operated under a permit. In this case, the selected remedy could be considered a corrective action at a solid waste management unit. The EPA would approve the use of in-situ fixation subject to ultimate confirmation of the effectiveness of the action. The monitoring program that is part of this remedy will satisfy the confirmation requirement.

The RI and FS reports and the Proposed Remedial Action Plan were supplied to the Department of Interior (DOI) and the Department of Commerce (DOC) as Natural Resource trustees. The DOC has concurred with the EPA's preferred alternative, while the DOI did not comment. The Agency for Toxic Substances and Disease Registry performed a health assessment for the site that concurred that the selected remedy offers adequate protection of public health.

This project was reviewed for concurrence with federal and state environmental requirements. The selected remedy complies with these requirements, including the floodplains executive order and

the discharge limits allowed by federal and state permits for surface water protection. Two federal statutes that were recognized as ARARs of particular concern for the remedial action at this site are the Endangered Species Act and the National Historic Preservation Act. The surface water near the site is within the breeding range of the short-nose sturgeon, a federal endangered species. However, it is unlikely that this species will be found in the vicinity of the site because of the disturbed condition of the rivers in this area. Therefore, the proposed action should not have a detrimental impact on this species. The EPA will confirm this through informal contact with the appropriate federal wildlife management agency. It also appears that the selected remedy will have no effect on any cultural resources on or eligible for nomination to the National Register of Historic Places.

The NJDEP has concurred with the selected remedy and has notified the EPA that State ARARs will be satisfied by performing a bioassay, for which plans are now being approved. The NJDEP has also indicated that contaminant concentrations in the soil at Chemical Control exceed State guidelines. Therefore, the No-Action alternative would not be acceptable. The selected remedy addresses this contamination.

Cost-effectiveness and Utilization of Permanent Solutions and Alternative Treatment Technologies

The selected remedy satisfies the preference in CERCLA for a permanent solution with treatment as a principal element. It also utilizes an alternative treatment technology that offers a more cost-effective remedy.

The contaminated soil at Chemical Control is responsible for the hazards posed by the site. The volume of this material is fairly small and the contamination is distributed over the entire site. Therefore, all of the alternatives addressed all of the contaminated soil at the site.

The In-situ Fixation alternative is the least expensive alternative that will quickly mitigate the hazards posed by the contaminated soils. It introduces fewer hazards during implementation than any of the other alternatives except the cap and groundwater barrier containment alternative, and it will prevent contamination from entering or leaving the site. Although treatment above ground can be directly observed and controlled, available information indicates that the in-situ operation offers a comparable level of long-term protection with less short-term risk and at a significantly lower cost. A treatability study and field test will be required during design to prove the technology, but such tests would be required for all treatment alternatives and the EPA is already testing this technology at other hazardous waste sites. Several companies offering chemical fixation have been identified. Therfore, the technology and equipment for this alternative should be available.

ATTACHMENT I

CHEMICAL CONTROL CORPORATION SITE
ELIZABETH, NEW JERSEY

RESPONSIVENESS SUMMARY

The U.S. Environmental Protection Agency (EPA) held a public comment period from July 6, 1987 through August 14, 1987 for interested citizens to comment on EPA's final Feasibility Study (FS) and proposed remedial action plan (PRAP) for the Chemical Control Corporation site. In addition, the EPA also held a public meeting on August 6, 1987 at the Elizabeth City Hall, to present the proposed remedial alternatives and preferred remedial action for the site.

This responsiveness summary provides a summary of citizens' comments and concerns about the Chemical Control Corporation site raised during the public comment period and the EPA's responses to those concerns. The comments addressed in this document will be factored into the EPA's final decision for addressing contamination at the site.

This responsiveness summary is divided into the following sections:

I. Background on Community Involvement and Concerns. This section provides a brief history of community involvement and concerns regarding the Chemical Control Corporation site.

II. Summary of Major Questions and Comments Received During the Public Meeting and EPA's Responses to these Comments. This section summarizes comments presented to EPA at the public meeting and provides EPA's responses to these comments.

III. Written Correspondence Received During the Public Comment Period and EPA's Responses. This section summarizes written comments received by EPA during the Public Comment Period and provides EPA's responses to these comments.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

The Chemical Control Corporation site is a former waste processing facility which, in the 1970s, accepted various wastes for disposal or recovery by neutralization, chemical treatment, or incineration. These wastes included acids, bases, arsenic compounds, cyanide compounds, flammable solvents, compressed gases, biological agents, explosive chemicals, pyrophoric (spontaneously igniting) materials, radioactive wastes, and pesticides.

Operations at the facility through the 1970s were frequently hampered by operating and mechanical problems, particularly with the incinerator. In addition, in January 1977, the Elizabeth, New Jersey police discovered that a truck owned by Chemical Control Corporation was discharging waste solvents onto the ground adjacent to the Elizabeth River. This was the first documented illegal action by Chemical Control Corporation and resulted in the owner of the facility being fined and sent to prison.

Starting in 1977, citizens and local officials complained on numerous occasions of bad odors from the site and observations of discharges to the ground and the nearby Elizabeth River. The Chemical Control Corporation facility was cited by the New Jersey Department of Environmental Protection (NJDEP) for violation of environmental regulations.

Community concern continued to increase until 1979 when the site was closed and placed in operational receivership. In March 1979, NJDEP developed a cleanup plan for the site. In April 1980, in the process of implementing the cleanup plan, a fire broke out at the site. Numerous investigations by local, State and Federal agencies were conducted during and after the fire in attempts to discover whether or not the fire was the result of arson. To date, the cause of the fire which resulted in a cloud of toxic gases, is unknown. At the time of the fire, community concern was high. Specifically, concerns focused on potential health risks to residents and fire fighting personnel from the toxic gases; potential environmental degradation to the site and the nearby Elizabeth River; and anger at the perceived improper behavior of the potentially responsible party. Closure of the facility and cleanup activity to date have alleviated much of the community concern.

In November 1986, the EPA began a remedial investigation and feasibility study (RI/FS) at the Chemical Control Corporation site. Citizen concern had leveled off substantially by this time and remained low throughout the RI/FS.

At the time of the public comment period, concern appeared to be highest among local officials and the media. The August 6 public meeting attracted more attention from the local news media than from the public. The main concern of local officials is that a thorough, permanent remedy be expeditously implemented.

II. SUMMARY OF MAJOR QUESTIONS AND COMMENTS RECEIVED DURING THE PUBLIC MEETING AND EPA RESPONSES TO THESE QUESTIONS

This section summarizes the comments made during the public meeting on the draft Feasibility Study. EPA responses to the comments are also provided below.

1. Comment: A city health official speaking on behalf of the City of Elizabeth stated that the administration supported combining alternative four and alternative seven. As a pharmacologist and a chemist, the individual expressed concern that because of the exotic nature of the chemicals involved, he could not be sure that the solidification fixation method would be sufficient. This official

recommended using both alternative four (In-Situ Fixation/ Soldification) and alternative seven (Excavation, Treatment and On-Site Disposal) so that if some contaminated material is missed during excavation, the solidification would take care of it. The official also was concerned that utility conduits not be placed in the area because PCB oil base material can wear through any kind of conduit. He also was concerned that EPA seemed mainly interested in treating the organics because, in his opinion, there also existed a high number of inorganics (i.e., heavy metals). He approved of the Agency concern that the treatment should be compatible with future use of the land. He felt strongly that the site should not be used for any kind of construction that would require digging and footings.

EPA Response: The EPA will take these comments into consideration as it makes the decision on the remedial alternative to be implemented at the Chemical Control site. The EPA followed up on the response with a letter to the City of Elizabeth. This letter is attached.

2. Comment: A representative of the National Oceanic Atmospheric Administration (NOAA), which is the natural resources trustee for coastal resources, stated that NOAA concurred with EPA on fixation and not excavation due to the risks that might be involved in the exposure of chemicals in the ground. The exposure during the excavation could lead to extended release into ground water.

EPA Response: None.

3. Comment: A resident commented that regulating hazardous waste handling and disposal would more efficiently address hazardous waste releases than cleanup after the fact. He also commented on the fixation method, expressing concern that at some point in the future the fixing agents would react with some of the contaminants, thus requiring complete removal of the contaminated soil. He suggested mixing the radon contaminated soil in Montclair, N.J. with the contaminated substance at Chemical Control, with the idea that they would neutralize each other.

EPA Response: The State and Federal regulations now in place are intended to prevent future problems like the Chemical Control site from occurring. Mixing the soils from the two sites would not effectively solve the problems at either site. The contaminated soil in Montclair contains radioactive radium that will continue to decay, producing radon gas, for many years and would not be rendered less hazardous by mixing it with the chemically contaminated soil from Chemical Control. The hazards associated with the chemical contaminants in the Chemical Control soil would not be mitigated by mixing the soil with the Montclair soil. The remedial action proposed for the Chemical Control site should effectively address the hazards currently posed by the site.
[The second comment raised by this individual was not addressed at the public meeting but was considered in preparing the Record of Decision. The In-situ Fixation remedial alternative should effectively immobilize the contaminants at the site and should prevent any disturbance of the soil (such as digging). Before the remedy is implemented, a treatability study will be performed to ensure that fixation will form a stable matrix.]

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION II
26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

August 31, 1987

Mr. John Surmay, Director
Department of Health, Welfare & Housing
Elizabeth City Hall
50-60 Winfield Scott Plaza
Elizabeth, New Jersey 07201

Dear Mr. Surmay:

I am writing in regard to your comments which were provided to the Environmental Protection Agency (EPA) during our recent public meeting to discuss the results of the feasibility study for the Chemical Control Superfund site.

At the public meeting on August 4, 1987, you expressed a preferrence, on behalf of the city administration, for a combination of two of the remedial alternatives developed in the feasibility study for this site. You recommended that we implement excavation with on-site soil washing followed by in-situ fixation/solidification of the treated soil. The EPA has given your comments careful consideration in developing the Record of Decision (ROD) for Chemical Control. The ROD which should be signed by the Regional Administrator, Christopher Daggett, in September will identify the selected remedial action. As Eric Schwarz of my staff, indicated to you on August 21, we feel that in-situ fixation will protect public health and the environment from any hazards posed by the site and, therefore, will recommend that Mr. Daggett select this alternative. The rationale for our action is described below.

The three treatment technologies that were considered for the on-site treatment alternatives - soil washing, fixation/solidification, and incineration - should all treat the soil to such a degree that it could be delisted as a hazardous waste under Federal regulations. We would, in fact, be required to prove that the treated soil was no longer hazardous, by testing it as specified in federal regulations, before we could return it to the site. Since the treated soil that would be returned to the site under the Excavation and On-site Treatment and Disposal alternative would not be hazardous, the use of in-situ fixation/solidification on this soil would not be warranted.

We have, however, considered the relative merits of excavation with on-site treatment as compared to in-situ treatment such as in-situ fixation. Treatment above ground can be directly observed and controlled whereas in-situ treatment cannot. However, available information indicates that in-situ fixation/ solidification should provide adequate mixing of the contaminated soil with the fixation chemicals to create a uniform, concrete-like block with very low permeability and may chemically bind the contaminants to the solidified mass. Chemical fixation has been used extensively to demobilize highly concentrated hazardous wastes, and the EPA is currently testing the system that is described in the Chemical Control feasibility study report at another hazardous waste site.

Using an in-situ remedial action at the site will also help avoid some problems that could arise during the implementation of an excavation alternative. As you pointed out at the public meeting, protective construction practices could be used to lessen the risk of releasing contaminants during excavation. However, especially in light of the history of flooding at the site, there would still be some risk of a release of contaminated soil if the site was excavated. The small size of the site would also complicate excavation. To excavate and treat contaminated soil at the site, we may need to use barges in the Elizabeth River to accomodate some of the equipment and the site may require excavation in many small cells.

All of the alternatives mentioned above involve treating the contaminated soil and, therefore, would require a treatability study during the design phase to determine the most cost-effective means of implementing the remedy. The design of the in-situ fixation remedial action will most likely involve a two-phase treatability study: a laboratory-scale study would combine soil samples from the site with fixing agents to determine the most effective agent and the degree of fixation obtained, and a pilot-scale, on-site test of the injection/delivery equipment would determine, in actual field conditions, the effectiveness of the in-situ operation. We welcome your comments on the planning and evaluation of these tests and intend to keep you apprised of our progress during the design of this action. In the event that these tests show that in-situ fixation would fail to offer protection of public health and the environment, the ROD would be amended as necessary.

I hope this letter addresses your comments to your satisfaction. If you have any additional comments or questions, please call me at (212) 264-1870.

Sincerely yours,

John S Frisco

John S. Frisco, Chief
New Jersey Remedial Action Branch

Stephanie Hogan
1042 Battle Hill Ter.
Union, N.J.
07083
8/4/87

Dear Mr. Schwarz -

I am a student at Kean College in Union N.J. I read a great deal of interest the article in the Star Ledger in reference to the E.P.A. holding a hearing on Chemical Control of contamination in Elizabeth.

I was amazed that these toxins have been stored on this site for the past seven years, and nothing has been done about it! I would be greatly surprised if these toxins have not been migrating into the air which I breath, as well as the water which I drink. Hopefully the migrations have been small but then who is to say how much is lethal over a twenty or thirty year span?

As a concerned citizen I would like to express my utter disgust for such things as this and encourage speedy and effective clean up as well as extremely strict toxic waste controls and harsh punishment for abusers. As far as any of the proposals for clean up only mide

of action is better than leaving the topics stored as they are now and have been for the past seven years. I therefore support the ~~past~~ last proposal, that of evacuation and incineration.

Yours Truly,

~~Stephanie~~
Hogan

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

AUG 18 1987

Ms. Stephanie Hogan
1042 Battle Hill Terrace
Union, New Jersey 07083

Dear Ms. Hogan:

Thank you for your letter concerning the Chemical Control Corporation Superfund site. I would like to correct some misimpressions that must have been created by newspaper articles based on the Environmental Protection Agency's (EPA's) press release. Hopefully, I can also reassure you that the New Jersey Department of Environmental Protection (NJDEP) and the EPA have already taken steps to control the pollution at the site and limit the potential risk from it. We are currently working to select a final remedy to address the remaining hazards posed by the site.

The federal government was given the power to respond to releases at uncontrolled hazardous waste sites by the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, commonly called Superfund. The Chemical Control site was included in the first list of Superfund sites. Even before it was added to this list, the State of New Jersey acted to close the facility and begin cleaning it up under New Jersey laws. The NJDEP removed tens of thousands of drums of hazardous wastes, several tons of bulk hazardous liquids and solids, the remains of a large building, and several large storage tanks from the site. The State also removed the most contaminated soil (to a depth of three feet), covered the site with gravel, enclosed it with a security fence, and treated contaminated ground water. The objective of the State's actions was to stabilize the site and address all of the imminent hazards. As a result of this action, which was completed in July 1981, the immediate hazards of direct contact with the waste and the release of hazardous materials to the air were eliminated.

The EPA has also completed several actions at the site pursuant to a contract with the State. Contaminated sand was removed from the storm sewer system near the site and this system was repaired. The EPA also removed drums, pails, and other containers from the Elizabeth River near the site and removed eleven contaminated trailers and a vacuum truck from the site.

The public meeting that was recently held at Elizabeth City Hall was called to discuss the findings of a study conducted by the EPA to determine the extent of contamination remaining at the site. The findings of this study are described in detail in reports that are available at Elizabeth City Hall. Briefly, a layer of contaminated soil was found below the gravel cover at the site. Although the soil is highly contaminated, the contaminants are adhering to the soil and very little contamination is entering the groundwater or the surface water. Also, all of the surface water and groundwater affected by the site is saline and therefore not used as a supply of drinking water.

The principal danger at the site is that natural forces or man could expose the contaminated soil. Accordingly, the EPA intends to implement a remedial action that will reduce or eliminate the possibility of exposing the contaminated soil at the site and will also reduce any leaching still further. The EPA is now considering comments that were received during the public comment period, and a Record of Decision that will select the final remedy is expected later this summer.

I hope this letter has satisfied your concerns about the Chemical Control site. More information is available in the reports kept at Elizabeth City Hall. If you have any questions, please do not hesitate to writer to me or call me at (212) 264-1252.

Sincerely yours,

Eric J. Schwarz

Eric J. Schwarz, Project Manager
Northern New Jersey Remedial Action Section

August 12, 1987

45

Mr. Eric J. Schwarz
Regional Project Manager
Environmental Protection Agency
Rm 711 26 Federal Plaza
New York, N.Y. 10278

Dear Sir:

I wish to stress the need for construction of a barrier between the Elizabeth River and the Chemical Control site prior to disruption of the contaminated soil on the site. At this time alternative # 4 looks to be satisfactory unless the level of P.C.B.s prove to be higher.

I wish for the record to show the entre of the request for implimentation of a running on site manifest of materials housed by licensed holding facilities such as Perk Chemical linked with the local fire departments. The information would include where on the site the materials are stored so emergency units would be aware of potential hazards.

This might be done via computer link up with such facilities.

I would like permission to enter the site periodically as an observer with the full understanding that the liability would be mine

Respectfully

George E. Miller

George E. Miller
P.O. Box 0224
Elizabeth, N.J
07206-0224

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
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26 FEDERAL PLAZA
NEW YORK, NEW YORK 10278

SEP 14 1987

Mr. George E. Miller
P.O. Box 0224
Elizabeth, New Jersey 07206-0224

Dear Mr. Miller:

Thank you for your letter of August 12, 1987 concerning the Chemical Control Corporation Superfund site. In your letter, you concurred with the Environmental Protection Agency's preferred alternative (Alternative 4 - In-situ Fixation) for site closure. You also asked several questions about future activities at the site.

The Environmental Protection Agency (EPA) will formally select a remedy for the soil contamination at the site later this month. The rationale for selecting the remedy will be described in a Record of Decision, which will be available at Elizabeth City Hall by early October. The Record of Decision will reflect comments the EPA received during the public comment period.

The next phase of the remedial action is to design the remedy. Plans and specifications will be developed so that contractors to implement the remedy will be able to bid on the job. The design will also include a treatability study to determine standards for the effectiveness of in-situ fixation.

Before the EPA begins a remedial action at any Superfund site, a contingency plan for that site is prepared. This plan identifies any emergency services that may be required during the implementation of the remedial action. It also establishes contacts within each organization that may be involved and defines procedures to be followed for all foreseeable emergencies. A contingency plan will be developed for Chemical Control before begining the remedial action.

I am afraid that we will not be able to allow you to have access to the site during the remedial action as you requested. Every effort is made to minimize the number of people present at the site during a response action to minimize the potential for exposing people to hazardous chemicals. We cannot grant access to any people who are not directly involved in the field work in progress. However, the small size of the Chemical Control Corporation site will make it possible to view most of the operations from South Front Street.

If you have any additional questions about the Chemical Control site, please do not hesitate to contact me.

Sincerely yours,

Eric J. Schwarz, Project Manager
Northern New Jersey Remedial Action Section